FIGURE 1

FIGURE 2

FIGURE 3

EM analysis

No Drug Control
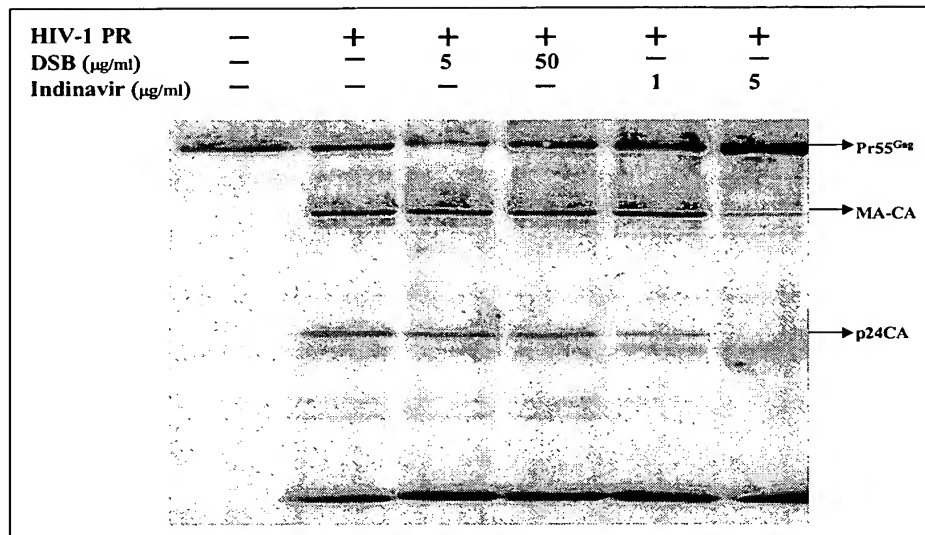
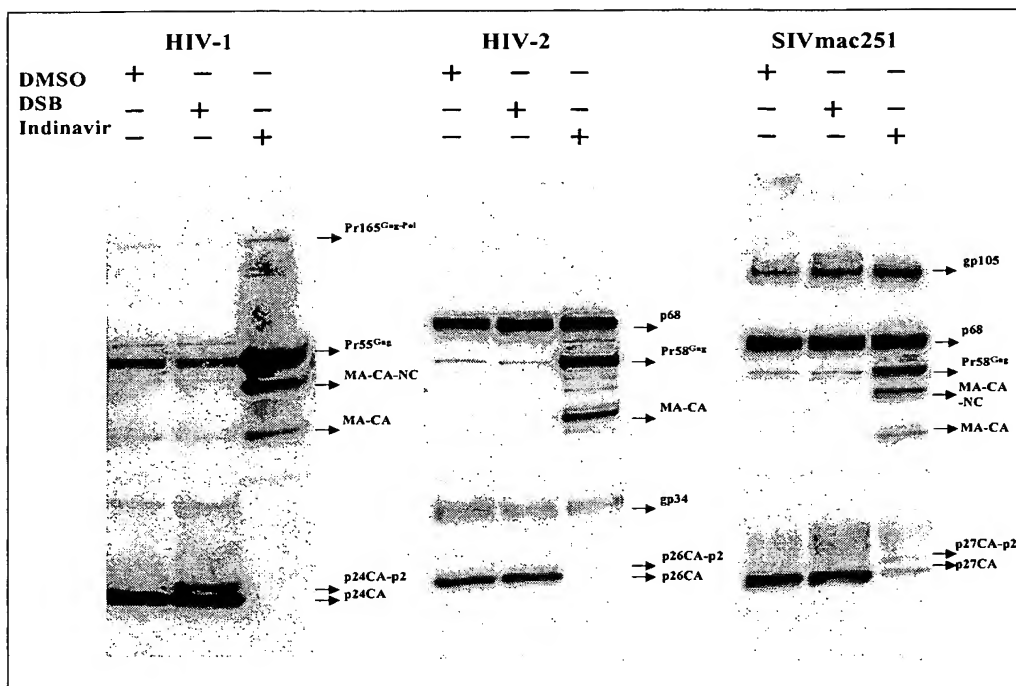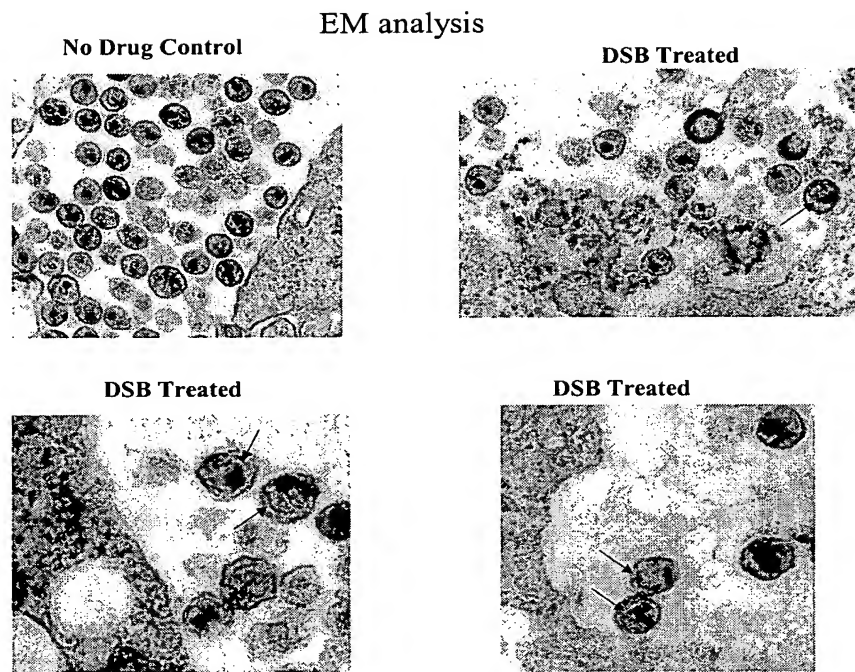**DSB Treated**

DSB Treated

DSB Treated

FIGURE 4

CA   **SP1**

Gag sequence #1: K-A-R-V-L/I-|-**A**-E-**A**-M-S (SEQ ID NO: 1)

Gag sequence #2: K-A-R-V-L-|-**V**-E-A-M-S (SEQ ID NO: 2)

Gag sequence #3: K-A-R-V-I-|-A-E-**V**-M-S (SEQ ID NO: 3)

FIGURE 5
(SEQ ID NO: 4)

```
ATGGGTGCGAGAGCGTCGGTATTAAGCGGGGGAGAATTAGATAAATGG
GAAAAAATTCGGTTAAGGCCAGGGGGAAAGAAACAATATAAACTAAAA
CATATAGTATGGGCAAGCAGGGAGCTAGAACGATTCGCAGTTAATCCT
GGCCTTTTAGAGACATCAGAAGGCTGTAGACAAATACTGGGACAGCTA
CAACCATCCCTTCAGACAGGATCAGAAGAACTTAGATCATTATATAAT
ACAATAGCAGTCCTCTATTGTGTGCATCAAAGGATAGATGTAAAAGAC
ACCAAGGAAGCCTTAGATAAGATAGAGGAAGAGCAAAACAAAAGTAAG
AAAAAGGCACAGCAAGCAGCAGCTGACACAGGAAACAACAGCCAGGTC
AGCCAAAATTACCCTATAGTGCAGAACCTCCAGGGGCAAATGGTACAT
CAGGCCATATCACCTAGAACTTTAAATGCATGGGTAAAAGTAGTAGAA
GAGAAGGCTTTCAGCCCAGAAGTAATACCCATGTTTTCAGCATTATCA
GAAGGAGCCACCCCACAAGATTTAAATACCATGCTAAACACAGTGGGG
GGACATCAAGCAGCCATGCAAATGTTAAAAGAGACCATCAATGAGGAA
GCTGCAGAATGGGATAGATTGCATCCAGTGCATGCAGGGCCTATTGCA
CCAGGCCAGATGAGAGAACCAAGGGGAAGTGACATAGCAGGAACTACT
AGTACCCTTCAGGAACAAATAGGATGGATGACACATAATCCACCTATC
CCAGTAGGAGAAATCTATAAAGATGGATAATCCTGGGATTAAATAAA
ATAGTAAGAATGTATAGCCCTACCAGCATTCTGGACATAAGACAAGGA
CCAAAGGAACCCTTTAGAGACTATGTAGACCGATTCTATAAAACTCTA
AGAGCCGAGCAAGCTTCACAAGAGGTAAAAAATTGGATGACAGAAACC
TTGTTGGTCCAAAATGCGAACCCAGATTGTAAGACTATTTTAAAAGCA
TTGGGACCAGGAGCGACACTAGAAGAAATGATGACAGCATGTCAGGGA
GTGGGGGGACCCGGCCATAAAGCAAGAGTTTTGGTTGAAGCAATGAGC
CAAGTAACAAATCCAGCTACCATAATGATACAGAAAGGCAATTTTAGG
AACCAAAGAAAGACTGTTAAGTGTTTCAATTGTGGCAAAGAAGGGCAC
ATAGCCAAAAATTGCAGGGCCCCTAGGAAAAAGGGCTGTTGGAAATGT
GGAAAGGAAGGACACCAAATGAAAGATTGTACTGAGAGACAGGCTAAT
TTTTTAGGGAAGATCTGGCCTTCCCACAAGGGAAGGCCAGGGAATTTT
CTTCAGAGCAGACCAGAGCCNACAGCCCCACCAGAAGAGAGCTTCAGG
TTTGGGGAAGAGACAACAACTCCCTCTCAGAAGCAGGAGCCGATAGAC
AAGGAACTGTATCCTTTAGCTTCCCTCAGATCACTCTTTGGCAGCGAC
CCCTCGTCACAATAAAGATAGGGGGGCAATTAAAGGAAGCTCTATTAG
ATACAGGAGCAGATGATACAGTATTAGAAGAAATGAATTTGCCAGGAA
GATGGAAACCAAAAATGATAGGGGGAATTGGAGGTTTTATCAAAGTAA
GACAGTATGATCAGATACTCATAGAAATCTGCGGACATAAAGCTATAG
GTACAGTATTAGTAGGACCTACACCTGTCAACATAATTGGAAGAAATC
TGTTGACTCAGATTGGCTGCACTTTAAATTTTCCCATTAGTCCTATTG
AGACTGTACCAGTAAAATTAAAGCCAGGAATGGATGGCCCAAAAGTT
```

FIGURE 6
(SEQ ID NO: 5)

ATGGGTGCGAGAGCGTCGGTATTAAGCGGGGGAGAATTAGATAAATGG
GAAAAAATTCGGTTAAGGCCAGGGGGAAAGAAACAATATAAACTAAAA
CATATAGTATGGGCAAGCAGGGAGCTAGAACGATTCGCAGTTAATCCT
GGCCTTTTAGAGACATCAGAAGGCTGTAGACAAATACTGGGACAGCTA
CAACCATCCCTTCAGACAGGATCAGAAGAACTTAGATCATTATATAAT
ACAATAGCAGTCCTCTATTGTGTGCATCAAAGGATAGATGTAAAAGAC
ACCAAGGAAGCCTTAGATAAGATAGAGGAAGAGCAAAACAAAAGTAAG
AAAAAGGCACAGCAAGCAGCAGCTGACACAGGAAACAACAGCCAGGTC
AGCCAAAATTACCCTATAGTGCAGAACCTCCAGGGGCAAATGGTACAT
CAGGCCATATCACCTAGAACTTTAAATGCATGGGTAAAAGTAGTAGAA
GAGAAGGCTTTCAGCCCAGAAGTAATACCCATGTTTTCAGCATTATCA
GAAGGAGCCACCCCACAAGATTTAAATACCATGCTAAACACAGTGGGG
GGACATCAAGCAGCCATGCAAATGTTAAAAGAGACCATCAATGAGGAA
GCTGCAGAATGGGATAGATTGCATCCAGTGCAGGCAGGGCCTATTGCA
CCAGGCCAGATGAGAGAACCAAGGGGAAGTGACATAGCAGGAACTACT
AGTACCCTTCAGGAACAAATAGGATGGATGACACATAATCCACCTATC
CCAGTAGGAGAAATCTATAAAAGATGGATAATCCTGGGATTAAATAAA
ATAGTAAGAATGTATAGCCCTACCAGCATTCTGGACATAAGACAAGGA
CCAAAGGAACCCTTTAGAGACTATGTAGACCGATTCTATAAAACTCTA
AGAGCCGAGCAAGCTTCACAAGAGGTAAAAAATTGGATGACAGAAACC
TTGTTGGTCCAAAATGCGAACCCAGATTGTAAGACTATTTTAAAAGCA
TTGGGACCAGGAGCGACACTAGAAGAAATGATGACAGCATGTCAGGGA
GTGGGGGGACCCGGCCATAAAGCAAGAGTTTTGGCTGAAGCAATGAGC
CAAGTAACAAATCCAGCTACCATAATGATACAGAAAGGCAATTTTAGG
AACCAAAGAAAGACTGTTAAGTGTTTCAATTGTGGCAAAGAAGGGCAC
ATAGCCAAAAATTGCAGGGCCCCTAGGAAAAAGGGCTGTTGGAAATGT
GGAAAGGAAGGACACCAAATGAAAGATTGTACTGAGAGACAGGCTAAT
TTTTTAGGGAAGATCTGGCCTTCCCACAAGGGAAGGCCAGGGAATTTT
CTTCAGAGCAGACCAGAGCCAACAGCCCCACCAGAAGAGAGCTTCAGG
TTTGGGGAAGAGACAACAACTCCCTCTCAGAAGCAGGAGCCGATAGAC
AAGGAACTGTATCCTTTAGCTTCCCTCAGATCACTCTTTGGCAGCGAC
CCCTCGTCACAATAAAGATAGGGGGGCAATTAAAGGAAGCTCTATTAG
ATACAGGAGCAGATGATACAGTATTAGAAGAAATGAATTTGCCAGGAA
GATGGAAACCAAAAATGATAGGGGGAATTGGAGGTTTTATCAAAGTAA
GACAGTATGATCAGATACTCATAGAAATCTGCGGACATAAAGCTATAG
GTACAGTATTAGTAGGACCTACACCTGTCAACATAATTGGAAGAAATC
TGTTGACTCAGATTGGCTGCACTTTAAATTTTCCCATTAGTCCTATTG
AGACTGTACCAGTAAAATTAAAGCCAGGAATGGATGGCCCAAAG

FIGURE 7A
(SEQ ID NO: 6)

```
ATGGGTGCGAGAGCGTCAGTATTAAGCGGCGGAAAATTAGACAAATGG
GAAAAAATTCGGTTAAGGCCAGGGGGAAAGAAAAGATATAAGTTAAAA
CATATAATATGGGCAAGCAGGGAGCTAGAACGATTTGCTGTCAATCCT
GGCCTTTTAGAGACAGCAGAGGGCTGTAGACAAATACTGGGACAGCTA
CAACCAGCCCTTCAGACAGGATCAGAAGAACTTAAATCATTATATAAT
GCAGTAGCAACCCTCTATTGTGTACATCAAAATATAGAGGTAAGAGAC
ACCAAGGAAGCTTTAGACAAGATAGAGGAAGAGCAAAACAAAAGTAAG
AAAAAGCACAGCAAGCAGCAGCTGACACAGGAAACGGCAGCCAGGTC
AGCCAAAATTACCCTATAGTGCAGAACCTTCAGGGGCAAATGGTACAT
CAAGCCATATCACCTAGAACTTTAAATGCATGGGTAAAGTAGTAGAA
GAGAAGGCTTTTAGCCCAGAAGTAATACCCATGTTTTCAGCATTATCA
GAAGGAGCCACCCCACAAGATTTAAACACCATGCTAAACACAGTGGGG
GGACATCAAGCAGCCATGCAAATGTTAAAAGAGACTATCAATGAGGAA
GCTGCAGAATGGGATAGATTGCATCCAGTGCAAGCAGGGCCTATTGCA
CCAGGCCAGATGAGAGAACCAAGGGGAAGTGACATAGCAGGAACCACT
AGTACCCTTCAGGAACAAATAGGATGGATGACAAATAATCCACCTATC
CCAGTAGGAGAAATCTATAAAAGGTGGATAATTCTGGGATTAAATAAA
ATAGTAAGAATGTATAGCCCCATCAGCATTCTGGACATAAGACAAGGA
CCTAAGGAACCCTTTAGAGACTATGTAGACCGGTTCTATAAAACTCTA
AGAGCCGAGCAAGCTTCACAGGATGTAAAAAATTGGATGACAGAAACC
TTGCTGGTCCAAAATGCGAACCCAGATTGTAAAACTATTTTAAAAGCA
TTGGGACCAGCAGCTACACTAGAAGAAATGATGACAGCATGTCAGGGA
GTAGGGGGACCCAGCCATAAAGCAAGAATTTTGGCTGAAGTAATGAGC
CAAGTAACAAATTCAGCTACCATAATGCTGCAGAAAGGTAATTTTAGG
GACCAAAGAAAAATTGTTAAGTGTTTCAACTGTGGCAAAGTAGGGCAC
ATAGCCAAAAATTGCAGGGCCCCTAGGAAAAAGGGCTGTTGGAAATGT
GGAAAGGAAGGACACCAAATGAAAGATTGCACTACTGAGGGACGACAG
GCTAATTTTTTAGGGAAAATCTGGCCTTCCCACAAGGGAAGGCCAGGG
AACTTTCTTCAGAGCAGACCAGAGCCAACAGCCCCACCAGAAGAGAGC
TTCAGGTTTGGGGAAGAGACAACTCCCTCTCAGAAGCAGGAGAAGATA
GACAAGGAACTGTATCCTTTAGCTTCCCTCAAATCACTCTTTGGCAAC
GACCCATCGTCACAGTAAAGATAGGGGGGCAATTAAAGGAAGCTCTAT
TAGATACAGGAGCAGATGATACAGTATTAGAAGAAATGAATTTGCCAG
GAAAATGGAAACCAAAAATGATAGGGGGAATTGGAGGTTTTATCAAAG
TAAGGCAGTATGATCAAATACTCATAGAAATCTGTGGACATAAAGCTA
TAGGTACAGTATTAGTAGGACCTACACCTGTCAACATAATTGGAAGAA
ATCTGTTGACTCAGATTGGTTGCACTTTAAATTTTCCCATTAGTCCTA
TTGAAACTATACCAGTAAAATTAAAGCCAGGAATGGATGGCCCAAAAG
TTAAACAATGGCCATTGACAGAGGAAAAAATAAAAGCATTGATAGAAA
TTTGTACAGAAATGGAAAAGGAAGGAAAAATTTCAAAAATTGGGCCTG
```

FIGURE 7B

AAAATCCATACAATACTCCAGTATTTGCCATAAAGAAAAANGACAGTA
CTAAATGGAGAAAA

FIGURE 8

(SEQ ID NO: 7)

ATGGGTGCGAGAGCGTCAGTATTAAGCGGCGGAAAATTAGACAAATGG
GAAAAAATTCGGTTAAGGCCAGGGGGAAAGAAAAGATATAAGTTAAAA
CATATAATATGGGCAAGCAGGGAGCTAGAACGATTTGCTGTCAATCCT
GGCCTTTTAGAGACAGCAGAGGGCTGTAGACAAATACTGGGACAGCTA
CAACCAGCCCTTCAGACAGGATCAGAAGAACTTAAATCATTATATAAT
GCAGTAGCAACCCTCTATTGTGTACATCAAAATATAGAGGTAAGAGAC
ACCAAGGAAGCTTTAGACAAGATAGAGGAAGAGCAAAACAAAAGTAAG
AAAAAGCACAGCAAGCAGCAGCTGACACAGGAAACGGCAGCCAGGTC
AGCCAAAATTACCCTATAGTGCAGAACCTTCAGGGGCAAATGGTACAT
CAAGCCATATCACCTAGAACTTTAAATGCATGGGTAAAGTAGTAGAA
GAGAAGGCTTTTAGCCCAGAAGTAATACCCATGTTTTCAGCATTATCA
GAAGGAGCCACCCCACAAGATTTAAACACCATGCTAAACACAGTGGGG
GGACATCAAGCAGCCATGCAAATGTTAAAAGAGACTATCAATGAGGAA
GCTGCAGAATGGGATAGATTGCATCCAGTGCAGCAGGGCCTATTGCA
CCAGGCCAGATGAGAGAACCAAGGGGAAGTGACATAGCAGGAACCACT
AGTACCCTTCAGGAACAAATAGGATGGATGACAAATAATCCACCTATC
CCAGTAGGAGAAATCTATAAAAGGTGGATAATTCTGGGATTAAATAAA
ATAGTAAGAATGTATAGCCCCATCAGCATTCTGGACATAAGACAAGGA
CCTAAGGAACCCTTTAGAGACTATGTAGACCGGTTCTATAAAACTCTA
AGAGCCGAGCAAGCTTCACAGGATGTAAAAAATTGGATGACAGAAACC
TTGCTGGTCCAAAATGCGAACCCAGATTGTAAACTATTTTAAAAGCA
TTGGGACCAGCAGCTACACTAGAAGAAATGATGACAGCATGTCAGGGA
GTAGGGGGACCCAGCCATAAAGCAAGAATTTTGGCTGAAGCAATGAGC
CAAGTAACAAATTCAGCTACCATAATGCTGCAGAAAGGTAATTTTAGG
GACCAAAGAAAAATTGTTAAGTGTTTCAACTGTGGCAAAGTAGGGCAC
ATAGCCAAAAATTGCAGGGCCCCTAGGAAAAAGGGCTGTTGGAAATGT
GGAAAGGAAGGACACCAAATGAAAGATTGCACTACTGAGGGACGACAG
GCTAATTTTTTAGGGAAAATCTGGCCTTCCCACAAGGGAAGGCCAGGG
AACTTTCTTCAGAGCAGACCAGAGCCAACAGCCCCACCAGAAGAGAGC
TTCAGGTTTGGGGAAGAGACAACTCCCTCTCAGAAGCAGGAGAAGATA
GACAAGGAACTGTATCCTTTAGCTTCCCTCAAATCACTCTTTGGCAAC
GACCCATCGTCACAGTAAAGATAGGGGGGCAATTAAAGGAAGCTCTAT
TAGATACAGGAGCAGATGATACAGTATTAGAAGAAATGAATTTGCCAG
GAAAATGGAAACCAAAAATGATAGGGGGAATTGGAGGTTTTATCAAAG
TAAGGCAGTATGATCAAATACTCATAGAAATCTGTGGACATAAAGCTA
TAGGTACAGTATTAGTAGGACCTACACCTGTCAACATAATTGGAAGAA
ATCTGTTGACTCAGATTGGTTGCACTTTAAATTTTCCCATTAGTCCTA
TTGAAACTATACCAGTAAAATTAAAGCCAGGAATGGATGGCCCAAAAG
TTAAACAATGGCCATTGACAGAGGAAAAAATAAAAGCATTGATAGAAA
TTTGTACAGAAATGGAAAAGGAAGGAAAAATT

FIGURE 9

AAAGCAAGAGTTTTGG[T]TGAAGCAATGAGC   (SEQ ID NO: 8)

AAAGCAAGAATTTTGGCTGAAG[T]AATGAGC   (SEQ ID NO: 9)

AAAGCAAGAGTTTTGGCTGAAGCAATGAGC   (SEQ ID NO: 10)

FIGURE 10

CA   SP1

K-A-R-L-M-|-<u>A</u>-E-<u>A</u>-L-K (SEQ ID NO: 11)